

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT7386054

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	SECURITY AGREEMENT

**CONVEYING PARTY DATA**

Name	Execution Date
MAXAR INTELLIGENCE INC.	06/14/2022
MAXAR SPACE LLC	06/14/2022

**RECEIVING PARTY DATA**

<b>Name:</b>	ROYAL BANK OF CANADA
<b>Street Address:</b>	155 WELLINGTON STREET W.
<b>City:</b>	TORONTO
<b>State/Country:</b>	CANADA
<b>Postal Code:</b>	M5V 3K7

**PROPERTY NUMBERS Total: 301**

Property Type	Number
Application Number:	13112583
Application Number:	13955429
Application Number:	15362254
Application Number:	16140052
Application Number:	16901674
Application Number:	14681043
Application Number:	15802743
Application Number:	16000844
Application Number:	13840743
Application Number:	15186171
Application Number:	14826740
Application Number:	14024399
Application Number:	14163008
Application Number:	14789893
Application Number:	13838475
Application Number:	13952464
Application Number:	13952442
Application Number:	14307307
Application Number:	15204307

PATENT

<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	13762355
<b>Application Number:</b>	14984613
<b>Application Number:</b>	16293409
<b>Application Number:</b>	14993074
<b>Application Number:</b>	15064609
<b>Application Number:</b>	14095637
<b>Application Number:</b>	15860281
<b>Application Number:</b>	14789877
<b>Application Number:</b>	15040780
<b>Application Number:</b>	14219884
<b>Application Number:</b>	15445949
<b>Application Number:</b>	14708129
<b>Application Number:</b>	14013904
<b>Application Number:</b>	14089405
<b>Application Number:</b>	13955268
<b>Application Number:</b>	15093040
<b>Application Number:</b>	14340389
<b>Application Number:</b>	16553060
<b>Application Number:</b>	15452076
<b>Application Number:</b>	16027235
<b>Application Number:</b>	14835736
<b>Application Number:</b>	15228954
<b>Application Number:</b>	14837628
<b>Application Number:</b>	14024418
<b>Application Number:</b>	16964292
<b>Application Number:</b>	14680495
<b>Application Number:</b>	14049189
<b>Application Number:</b>	14010450
<b>Application Number:</b>	14049199
<b>Application Number:</b>	15077886
<b>Application Number:</b>	10849276
<b>Application Number:</b>	14063309
<b>Application Number:</b>	14976400
<b>Application Number:</b>	14941504
<b>Application Number:</b>	14810382
<b>Application Number:</b>	11835169
<b>Application Number:</b>	10684295
<b>Application Number:</b>	14800644

<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	10908695
<b>Application Number:</b>	12463797
<b>Application Number:</b>	16709673
<b>Application Number:</b>	15241034
<b>Application Number:</b>	16150177
<b>Application Number:</b>	15694353
<b>Application Number:</b>	14499440
<b>Application Number:</b>	14819839
<b>Application Number:</b>	14095608
<b>Application Number:</b>	13417568
<b>Application Number:</b>	11764765
<b>Application Number:</b>	12606918
<b>Application Number:</b>	15825478
<b>Application Number:</b>	16804315
<b>Application Number:</b>	15802313
<b>Application Number:</b>	16438384
<b>Application Number:</b>	17037305
<b>Application Number:</b>	14730176
<b>Application Number:</b>	15672267
<b>Application Number:</b>	14788651
<b>Application Number:</b>	16224400
<b>Application Number:</b>	15194541
<b>Application Number:</b>	15709252
<b>Application Number:</b>	13840173
<b>Application Number:</b>	14680665
<b>Application Number:</b>	16507012
<b>Application Number:</b>	15262118
<b>Application Number:</b>	14091412
<b>Application Number:</b>	15391786
<b>Application Number:</b>	16182367
<b>Application Number:</b>	15465581
<b>Application Number:</b>	14730227
<b>Application Number:</b>	16533386
<b>Application Number:</b>	17069776
<b>Application Number:</b>	15906348
<b>Application Number:</b>	15608894
<b>Application Number:</b>	14053332
<b>Application Number:</b>	15716425

<b>Property Type</b>	<b>Number</b>
Application Number:	11753272
Application Number:	15812124
Application Number:	13835804
Application Number:	16685990
Application Number:	16805461
Application Number:	16685977
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Application Number:	15710740
Application Number:	17110127
Application Number:	16276987
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Application Number:	17076444
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Application Number:	15633007
Application Number:	15461381
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Application Number:	15394512
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Application Number:	17110115
Application Number:	15926186
Application Number:	16405162
Application Number:	15163465
Application Number:	16505937
Application Number:	15221273
Application Number:	15618897
Application Number:	15173083
Application Number:	15926628
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Application Number:	16111008
Application Number:	15682785
Application Number:	15172825
Application Number:	15173054
Application Number:	15172882

<b>Property Type</b>	<b>Number</b>
Application Number:	15173097
Application Number:	15218009
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Application Number:	15172978
Application Number:	15799258
Application Number:	15172859
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Application Number:	15267828
Application Number:	15818542
Application Number:	15885484
Application Number:	14734996
Application Number:	15699909
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Application Number:	10244944
Application Number:	13240079
Application Number:	12779872
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Application Number:	15263209
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Application Number:	14097020
Application Number:	13164414
Application Number:	14973186
Application Number:	14685302
Application Number:	13093669
Application Number:	14089067
Application Number:	10094898
Application Number:	14939433
Application Number:	15445797
Application Number:	15247052
Application Number:	14659222
Application Number:	13870761
Application Number:	15616803
Application Number:	13189354
Application Number:	15488179
Application Number:	14222136
Application Number:	15225525
Application Number:	14965620
Application Number:	13247243

<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	14968725
<b>Application Number:</b>	14632482
<b>Application Number:</b>	15603288
<b>Application Number:</b>	15441040
<b>Application Number:</b>	15352471
<b>Application Number:</b>	15470592
<b>Application Number:</b>	12928135
<b>Application Number:</b>	13442252
<b>Application Number:</b>	17180615
<b>Application Number:</b>	15480276
<b>Application Number:</b>	13215929
<b>Application Number:</b>	13729848
<b>Application Number:</b>	15144487
<b>Application Number:</b>	14937208
<b>Application Number:</b>	14954583
<b>Application Number:</b>	15372276
<b>Application Number:</b>	15904063
<b>Application Number:</b>	13644632
<b>Application Number:</b>	11467490
<b>Application Number:</b>	12856468
<b>Application Number:</b>	14183263
<b>Application Number:</b>	13101944
<b>Application Number:</b>	15887721
<b>Application Number:</b>	14939445
<b>Application Number:</b>	15709341
<b>Application Number:</b>	15394602
<b>Application Number:</b>	14864669
<b>Application Number:</b>	14300032
<b>Application Number:</b>	15261696
<b>Application Number:</b>	14300027
<b>Application Number:</b>	15166033
<b>Application Number:</b>	14596096
<b>Application Number:</b>	13237761
<b>Application Number:</b>	12800450
<b>Application Number:</b>	15438620
<b>Application Number:</b>	15441032
<b>Application Number:</b>	14596101
<b>Application Number:</b>	14092775

<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15622888
<b>Application Number:</b>	15277505
<b>Application Number:</b>	15900653
<b>Application Number:</b>	13340095
<b>Application Number:</b>	13800365
<b>Application Number:</b>	15831258
<b>Application Number:</b>	11891086
<b>Application Number:</b>	15470600
<b>Application Number:</b>	15225588
<b>Application Number:</b>	15920294
<b>Application Number:</b>	15364115
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<b>Application Number:</b>	15847780
<b>Application Number:</b>	15809856
<b>Application Number:</b>	15180444
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<b>Application Number:</b>	14972736
<b>Application Number:</b>	07907151
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<b>Application Number:</b>	13068655
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<b>Application Number:</b>	14161343
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<b>Application Number:</b>	13170813
<b>Application Number:</b>	13665717
<b>Application Number:</b>	15488166
<b>Application Number:</b>	15388269
<b>Application Number:</b>	13026175
<b>Application Number:</b>	12925386
<b>Application Number:</b>	13793922

<b>Property Type</b>	<b>Number</b>
Application Number:	15461369
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Application Number:	15461377
Application Number:	15599852
Application Number:	12344064
Application Number:	15092413
Application Number:	14875491
Application Number:	15689993
Application Number:	16855356
Application Number:	14918337
Application Number:	13665722
Application Number:	14108213
Application Number:	15351233
Application Number:	16748617
Application Number:	09346272
Application Number:	13624410
Application Number:	14729883
Application Number:	13053084
Application Number:	15654593
Application Number:	15466610
Application Number:	15336541
Application Number:	09995017
Application Number:	13326654
Application Number:	13115370
Application Number:	13683887
Application Number:	12629707
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Application Number:	15985357
Application Number:	15729502
Application Number:	11709614
Application Number:	13647207
Application Number:	14627936
Application Number:	15849289
Application Number:	14962941
Application Number:	15441037
Application Number:	15160258
Application Number:	14580063
Application Number:	15053998



Property Type	Number
Application Number:	15053993
Application Number:	13223041
Application Number:	15970693
Application Number:	14995070
Application Number:	15201208
Application Number:	13728745
Application Number:	13474084
Application Number:	16855483
Application Number:	17022550
Application Number:	17038213
Application Number:	17083004
Application Number:	17509579
Application Number:	16539348
Application Number:	13452768
Application Number:	15490866
Application Number:	13452741

**CORRESPONDENCE DATA**

**Fax Number:**

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

**Phone:** 2126834120

**Email:** luis.rodriguez@unitedcorporate.com

**Correspondent Name:** ELAINE CARRERA, SENIOR PARALEGAL

**Address Line 1:** 32 OLD SLIP

**Address Line 2:** C/O CAHILL GORDON & REINDEL LLP

**Address Line 4:** NEW YORK, NEW YORK 10005

**NAME OF SUBMITTER:** ELAINE CARRERA

**SIGNATURE:** /Elaine Carrera/

**DATE SIGNED:** 06/16/2022

**Total Attachments: 38**

source=03c. Maxar - Patent Security Agreement#page1.tif  
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RECORDATION FORM COVER SHEET  
**PATENTS ONLY**

To the Director of the U.S. Patent and Trademark Office: Please record the attached documents or the new address(es) below.

**1. Name of conveying party(ies)**  
MAXAR INTELLIGENCE INC.  
MAXAR SPACE LLC

Additional name(s) of conveying party(ies) attached?  Yes  No

**2. Name and address of receiving party(ies)**  
Name: ROYAL BANK OF CANADA  
Internal Address: \_\_\_\_\_

**3. Nature of conveyance/Execution Date(s):**  
Execution Date(s) June 14, 2022

Assignment  Merger  
 Security Agreement  Change of Name  
 Joint Research Agreement  
 Government Interest Assignment  
 Executive Order 9424, Confirmatory License  
 Other \_\_\_\_\_

Street Address: 155 Wellington Street W.  
City: Toronto  
State: Ontario  
Country: Canada Zip: M5V 3K7

Additional name(s) & address(es) attached?  Yes  No

**4. Application or patent number(s):**  This document serves as an Oath/Declaration (37 CFR 1.63).

A. Patent Application No.(s)  
See Schedule I

B. Patent No.(s)  
See Schedule I

Additional numbers attached?  Yes  No

**5. Name and address to whom correspondence concerning document should be mailed:**  
Name: Elaine Carrera, Senior Paralegal  
Internal Address: \_\_\_\_\_  
Street Address: c/o Cahill Gordon & Reindel LLP,  
32 Old Slip  
City: New York  
State: NY Zip: 10005  
Phone Number: (212) 701-3365  
Docket Number: \_\_\_\_\_  
Email Address: ecarrera@cahill.com

**6. Total number of applications and patents involved:** 302

**7. Total fee (37 CFR 1.21(h) & 3.41) \$** \_\_\_\_\_

Authorized to be charged to deposit account  
 Enclosed  
 None required (government interest not affecting title)

**8. Payment Information**

Deposit Account Number \_\_\_\_\_  
Authorized UserName \_\_\_\_\_

**9. Signature:** Elaine Carrera June 14, 2022  
Signature Date

Elaine Carrera Total number of pages including cover sheet, attachments, and documents: 38  
Name of Person Signing

Documents to be recorded (including cover sheet) should be faxed to (571) 273-0148, or mailed to:  
Mail Stop Assignment Recordation Services, Director of the USPTO, P.O.Box 1460, Alexandria, V.A. 22313-1460

PATENT SECURITY AGREEMENT

PATENT SECURITY AGREEMENT, dated as of June 14, 2022, made by each of the undersigned grantors (individually, a “Grantor”, and, collectively, the “Grantors”), in favor of Royal Bank of Canada, in its capacity as Agent.

W I T N E S S E T H:

WHEREAS, the Grantors and Maxar Technologies Inc., a Delaware corporation (the “Company”) are party to that certain Amended and Restated Security Agreement, dated as of June 14, 2022 (as amended, amended and restated, supplemented or otherwise modified from time to time, the “Security Agreement”), in favor of the Agent pursuant to which the Grantors have agreed to execute and deliver this Patent Security Agreement (this “Patent Security Agreement”); and

WHEREAS, the Company and Royal Bank of Canada, as Agent entered into that certain Second Amended and Restated Credit Agreement, dated as of June 14, 2022 (as amended, amended and restated, modified, supplemented, extended or renewed from time to time, the “Credit Agreement”), and in respect of such Credit Agreement, each Guarantor has agreed to guarantee the Obligations under the Credit Agreement;

NOW, THEREFORE, in consideration of the premises, the Grantors hereby agree with the Agent as follows:

SECTION 1. Defined Terms. Unless otherwise defined herein, terms defined in the Security Agreement and used herein have the meaning given to them in the Security Agreement.

SECTION 2. Grant of Security Interest in Patent Collateral. Each Grantor hereby pledges and grants to the Agent for the benefit of the Secured Parties a lien on and security interest in and to all of its right, title and interest in, to and under all the following Collateral of such Grantor:

- (a) patents of such Grantor, including those listed on Schedule I attached hereto (other than Excluded Collateral); and
- (b) all Proceeds of any and all of the foregoing.

SECTION 3. Security Agreement. The security interest granted pursuant to this Patent Security Agreement is granted in conjunction with the security interest granted to the Agent pursuant to the Security Agreement and Grantors hereby acknowledge and affirm that the rights and remedies of the Agent with respect to the security interest in the Patents made and granted hereby are more fully set forth in the Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein. In the event that any provision of this Patent Security Agreement is deemed to conflict with the Security Agreement, the provisions of the Security Agreement shall control.

SECTION 4. Termination. Upon the release of the Grantors in accordance with Section 5.1 of the Security Agreement, the Agent, at the sole cost and expense of the Grantors, shall execute, acknowledge, and deliver to the Grantors an instrument in writing in recordable form releasing the collateral pledge, grant, assignment, lien and security interest in the Patents under this Patent Security Agreement.

SECTION 5. Counterparts. This Patent Security Agreement may be executed in counterparts (which may include counterparts delivered by any standard form of telecommunication), each of which shall be deemed to be an original, but all of which shall constitute one and the same agreement.

Delivery of an executed counterpart of a signature page of this Agreement by facsimile transmission or by “.pdf” or similar electronic transmission shall be effective as delivery of a manually executed counterpart hereof. The words “execution,” “signed,” “signature,” “delivery,” and words of like import in this Agreement shall be deemed to include electronic signatures or electronic records, each of which shall be of the same legal effect, validity or enforceability as a manually executed signature, physical delivery thereof or the use of a paper-based recordkeeping system, as the case may be, to the extent and as provided for in any applicable law, including the Federal Electronic Signatures in Global and National Commerce Act, the New York State Electronic Signatures and Records Act, or any other similar state laws based on the Uniform Electronic Transactions Act.

SECTION 6. Governing Law. This Patent Security Agreement and the transactions contemplated hereby, and all disputes between the parties under or relating to this Patent Security Agreement or the facts or circumstances leading to its execution, whether in contract, tort or otherwise, shall be construed in accordance with and governed by the laws (including statutes of limitation) of the State of New York, without regard to conflicts of law principles that would require the application of the laws of another jurisdiction.

SECTION 7. First Lien Intercreditor Agreement. This Patent Security Agreement is subject to the terms and conditions set forth in the First Lien Intercreditor Agreement in all respects and, in the event of any conflict between the terms of the First Lien Intercreditor Agreement and this Patent Security Agreement, the terms of the First Lien Intercreditor Agreement shall govern.


SECTION 8. Concerning the Agent. Royal Bank of Canada is entering into this Patent Security Agreement solely in its capacity as Agent under the Credit Agreement and shall be entitled to all of the rights, privileges and immunities granted to the Agent under the Credit Agreement as if such rights, privileges and immunities were set forth herein.

[Signature Pages Follow]

IN WITNESS WHEREOF, each Grantor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

Very truly yours,

**MAXAR INTELLIGENCE INC.  
MAXAR SPACE LLC**

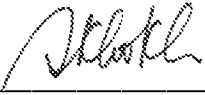
By:   
Name: Biggs C. Porter  
Title: Executive Vice President and  
Chief Financial Officer

IN WITNESS WHEREOF, each Grantor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

Very truly yours,

Accepted and Agreed to:

ROYAL BANK OF CANADA, as Agent

By:  \_\_\_\_\_

Name: Susan Khokher  
Title: Manager, Agency

**SCHEDULE I**  
to  
**PATENT SECURITY AGREEMENT**  
**PATENT REGISTRATIONS AND PATENT APPLICATIONS**

**PATENTS AND PATENT APPLICATIONS:**

Title	Country	Application No.	Application Date	Publication No.	Publication Date	Registration No.	Registration Date	Case Status	Record Owner
ADVANCED CLOUD COVER ASSESSMENT	United States	13/112,583	05-20-2011			8,594,375	11-26-2013	Granted	DIGITALGLOBE, INC. 1
ADVANCED CLOUD COVER ASSESSMENT FOR PANCHROMATIC IMAGES	United States	13/955,429	07-31-2013	US 2014-0029844 A1	01-30-2014	8,913,826	12-16-2014	Granted	DIGITALGLOBE, INC.
ADVANCED CLOUD DETECTION USING MACHINE LEARNING AND OPTIMIZATION TECHNIQUES	United States	15/362,254	11-28-2016	US 2018-0150677 A1	05-31-2018	10,083,354	09-25-2018	Granted	DIGITALGLOBE, INC.
ADVANCED CLOUD DETECTION USING NEURAL NETWORKS AND OPTIMIZATION TECHNIQUES	United States	16/140,052	09-24-2018	US 2019-0034754 A1	01-31-2019	10,685,253	06-16-2020	Granted	DIGITALGLOBE, INC.
ADVANCED CLOUD DETECTION USING NEURAL NETWORKS AND OPTIMIZATION TECHNIQUES	United States	16/901,674	06-15-2020	US 2021-0103758 A1	04-08-2021			Pending	DIGITALGLOBE, INC.
ADVANCED SEMI-AUTOMATED VECTOR EDITING IN TWO AND THREE DIMENSIONS	United States	14/681,043	04-07-2015	US 2016-0012276 A1	01-14-2016	10,133,928	11-20-2018	Granted	DIGITALGLOBE, INC.

<sup>1</sup> DigitalGlobe, Inc. is a prior name of Maxar Intelligence Inc. Company to update record ownership.



ANOMALY DETECTION USING NON-TARGET CLUSTERING	United States	15/802,743	11-03-2017	US 2018-0330190 A1	11-15-2018	10,679,055	06-09-2020	Granted	DIGITALGLOBE, INC.
ATMOSPHERIC COMPENSATION IN SATELLITE IMAGERY	United States	16/000,844	06-05-2018	US 2019-0130547 A1	05-02-2019	10,832,390	11-10-2020	Granted	DIGITALGLOBE, INC.
ATMOSPHERIC COMPENSATION IN SATELLITE IMAGERY	United States	13/840,743	03-15-2013	US 2014-0270332 A1	09-18-2014	9,396,528	07-19-2016	Granted	DIGITALGLOBE, INC.
ATMOSPHERIC COMPENSATION IN SATELLITE IMAGERY	United States	15/186,171	06-17-2016	US 2016-0300336 A1	10-13-2016	9,990,705	06-05-2018	Granted	DIGITALGLOBE, INC.
AUTOMATED AND SCALABLE OBJECT AND FEATURE EXTRACTION FROM IMAGERY	United States	14/826,740	08-14-2015	US 2015-0356373 A1	12-10-2015	9,569,690	02-14-2017	Granted	DIGITALGLOBE, INC.
AUTOMATED AND SCALABLE OBJECT AND FEATURE EXTRACTION FROM IMAGERY	United States	14/024,399	09-11-2013	US 2015-0071538 A1	03-12-2015	9,141,872	09-22-2015	Granted	DIGITALGLOBE, INC.
AUTOMATED COMPOUND STRUCTURE CHARACTERIZATION IN OVERHEAD IMAGERY	United States	14/163,008	01-24-2014	US 2015-0154465 A1	06-04-2015	9,639,755	05-02-2017	Granted	DIGITALGLOBE, INC.
AUTOMATED CONVERSION OF TWO-DIMENSIONAL HYDROLOGY VECTOR MODELS INTO VALID THREE-DIMENSIONAL HYDROLOGY VECTOR MODELS	United States	14/789,893	07-01-2015	US 2016-0005225 A1	01-07-2016	9,626,565	04-18-2017	Granted	DIGITALGLOBE, INC.
AUTOMATED GEOSPATIAL IMAGE MOSAIC GENERATION	United States	13/838,475	03-15-2013	US 2014-0270569 A1	09-18-2014	9,042,674	05-26-2015	Granted	DIGITALGLOBE, INC.
AUTOMATED GEOSPATIAL IMAGE MOSAIC GENERATION WITH AUTOMATIC CUTLINE GENERATION	United States	13/952,464	07-26-2013	US 2014-0267390 A1	09-18-2014	9,135,505	09-15-2015	Granted	DIGITALGLOBE, INC.

AUTOMATED GEOSPATIAL IMAGE MOSAIC GENERATION WITH AUTOMATIC SOURCE SELECTION	United States	13/952,442	07-26-2013	US 2015-0262335 A1	09-17-2015	9,202,259	12-01-2015	Granted	DIGITALGLOBE, INC.
AUTOMATED GEOSPATIAL IMAGE MOSAIC GENERATION WITH MULTIPLE ZOOM LEVEL SUPPORT	United States	14/307,307	06-17-2014	US 2015-0363641 A1	12-17-2015	9,396,391	07-19-2016	Granted	DIGITALGLOBE, INC.
AUTOMATED GEOSPATIAL IMAGE MOSAIC GENERATION WITH MULTIPLE ZOOM LEVEL SUPPORT	United States	15/204,307	07-07-2016	US 2016-0321501 A1	11-03-2016	9,940,514	04-10-2018	Granted	DIGITALGLOBE, INC.
AUTOMATED METRIC INFORMATION NETWORK	United States	13/762,355	02-07-2013	US 2014-0219514 A1	08-07-2014	9,251,419	02-02-2016	Granted	DIGITALGLOBE, INC.
AUTOMATED METRIC INFORMATION NETWORK	United States	14/984,613	12-30-2015	US 2016-0117552 A1	04-28-2016	9,875,404	01-23-2018	Granted	DIGITALGLOBE, INC.
AUTOMATED REGISTRATION OF THREE-DIMENSIONAL VECTORS TO THREE-DIMENSIONAL LINEAR FEATURES IN REMOTELY-SENSED DATA	United States	16/293,409	03-05-2019	US 2020-0066033 A1	02-27-2020	11,017,593	05-25-2021	Granted	DIGITALGLOBE, INC.
AUTOMATED REGISTRATION OF THREE-DIMENSIONAL VECTORS TO THREE-DIMENSIONAL LINEAR FEATURES IN REMOTELY-SENSED DATA	United States	14/993,074	01-11-2016	US 2016-0125660 A1	05-05-2016	10,223,828	03-05-2019	Granted	DIGITALGLOBE, INC.
AUTOMATED REMOTE CAR COUNTING	United States	15/064,609	03-09-2016	US 2016-0188953 A1	06-30-2016	9,619,710	04-11-2017	Granted	DIGITALGLOBE, INC.
AUTOMATED REMOTE CAR COUNTING	United States	14/095,637	12-03-2013	US 2015-0016669 A1	01-15-2015	9,122,930	09-01-2015	Granted	DIGITALGLOBE, INC.

AUTOMATED SEAMLINE CONSTRUCTION FOR HIGH-QUALITY HIGH-RESOLUTION ORTHOMOSAICS	United States	15/860,281	01-02-2018	US 2019-0005618 A1	01-03-2019	10,346,952	07-09-2019	Granted	DIGITALGLOBE, INC.
AUTOMATED SEAMLINE CONSTRUCTION FOR HIGH-QUALITY HIGH-RESOLUTION ORTHOMOSAICS	United States	14/789,877	07-01-2015	US 2016-0005149 A1	01-07-2016	9,858,645	01-02-2018	Granted	DIGITALGLOBE, INC.
AUTOMATED SLIVER REMOVAL IN ORTHOMOSAIC GENERATION	United States	15/040,780	02-10-2016	US 2016-0171654 A1	06-16-2016	9,916,640	03-13-2018	Granted	DIGITALGLOBE, INC.
AUTOMATED SLIVER REMOVAL IN ORTHOMOSAIC GENERATION	United States	14/219,884	03-19-2014	US 2015-0269707 A1	09-24-2015	9,367,895	06-14-2016	Granted	DIGITALGLOBE, INC.
AUTOMATED TONAL BALANCING	United States	15/445,949	02-28-2017	US 2017-0301070 A1	10-19-2017	10,311,557	06-04-2019	Granted	DIGITALGLOBE, INC.
AUTOMATED TONAL BALANCING	United States	14/708,129	05-08-2015	US 2015-0324988 A1	11-12-2015	9,589,334	03-07-2017	Granted	DIGITALGLOBE, INC.
AUTOMATIC EXTRACTION OF BUILT-UP FOOTPRINTS FROM HIGH RESOLUTION OVERHEAD IMAGERY THROUGH MANIPULATION OF ALPHA-TREE DATA STRUCTURES	United States	14/013,904	08-29-2013	US 2015-0023550 A1	01-22-2015	9,031,325	05-12-2015	Granted	DIGITALGLOBE, INC.
AUTOMATIC EXTRACTION OF BUILT-UP FOOTPRINTS FROM HIGH RESOLUTION OVERHEAD IMAGERY THROUGH MANIPULATION OF ALPHA-TREE DATA STRUCTURES	United States	14/089,405	11-25-2013			8,682,079	03-25-2014	Granted	DIGITALGLOBE, INC.

AUTOMATIC GENERATION OF BUILT-UP LAYERS FROM HIGH RESOLUTION SATELLITE IMAGE DATA	United States	13/955,268	07-31-2013	US 2015-0036874 A1	02-05-2015	9,230,168	01-05-2016	Granted	DIGITALGLOBE, INC.
BATHYMETRIC TECHNIQUES USING SATELLITE IMAGERY	United States	15/093,040	04-07-2016	US 2016-0314336 A1	10-27-2016	9,767,361	09-19-2017	Granted	DIGITALGLOBE, INC.
BATHYMETRIC TECHNIQUES USING SATELLITE IMAGERY	United States	14/340,389	07-24-2014	US 2015-0248576 A1	09-03-2015	9,336,441	05-10-2016	Granted	DIGITALGLOBE, INC.
BROAD AREA GEOSPATIAL OBJECT DETECTION USING AUTOGENERATED DEEP LEARNING MODELS	United States	16/553,060	08-27-2019	US 2020-0118292 A1	04-16-2020	10,733,759	08-04-2020	Granted	DIGITALGLOBE, INC.
BROAD AREA GEOSPATIAL OBJECT DETECTION USING AUTOGENERATED DEEP LEARNING MODELS	United States	15/452,076	03-07-2017	US 2017-0301108 A1	10-19-2017	10,013,774	07-03-2018	Granted	DIGITALGLOBE, INC.
BROAD AREA GEOSPATIAL OBJECT DETECTION USING AUTOGENERATED DEEP LEARNING MODELS	United States	16/027,235	07-03-2018	US 2019-0043217 A1	02-07-2019	10,395,388	08-27-2019	Granted	DIGITALGLOBE, INC.
BROAD AREA GEOSPATIAL OBJECT DETECTION USING AUTOGENERATED DEEP LEARNING MODELS	United States	14/835,736	08-26-2015	US 2017-0061249 A1	03-02-2017	9,589,210	03-07-2017	Granted	DIGITALGLOBE, INC.
CHOREOGRAPHING AUTOMATED AND MANUAL PROCESSES IN SUPPORT OF MOSAIC GENERATION	United States	15/228,954	08-04-2016	US 2017-0041550 A1	02-09-2017	10,120,884	11-06-2018	Granted	DIGITALGLOBE, INC.
CLASSIFICATION OF LAND BASED ON ANALYSIS OF REMOTELY-SENSED EARTH IMAGES	United States	14/837,628	08-27-2015	US 2015-0371115 A1	12-24-2015	9,619,734	04-11-2017	Granted	DIGITALGLOBE, INC.
CLASSIFICATION OF LAND BASED ON ANALYSIS OF REMOTELY-SENSED EARTH IMAGES	United States	14/024,418	09-11-2013	US 2015-0071528 A1	03-12-2015	9,147,132	09-29-2015	Granted	DIGITALGLOBE, INC.

CLOUD COMPUTING FLEXIBLE LARGE AREA MOSAIC ENGINE	United States	16/964,292	07-23-2020	US 2021-0035265 A1	02-04-2021			Pending	DIGITALGLOBE, INC.
CROWDSOURCED FEATURE IDENTIFICATION AND ORTHORECTIFICATION	United States	14/680,495	04-07-2015	US 2015-0331890 A1	11-19-2015	10,078,645	09-18-2018	Granted	DIGITALGLOBE, INC.
CROWDSOURCED IMAGE ANALYSIS PLATFORM	United States	14/049,189	10-08-2013	US 2014-0237386 A1	08-21-2014	9,560,092	01-31-2017	Granted	DIGITALGLOBE, INC.
CROWDSOURCED SEARCH AND LOCATE PLATFORM	United States	14/010,450	08-26-2013	US 2014-0236851 A1	08-21-2014	9,122,708	09-01-2015	Granted	DIGITALGLOBE, INC.
CROWDSOURCED SEARCH AND LOCATE PLATFORM	United States	14/049,199	10-08-2013	US 2014-0233863 A1	08-21-2014	9,128,959	09-08-2015	Granted	DIGITALGLOBE, INC.
ENHANCED CROWDSOURCED SEARCH AND LOCATE PLATFORM	United States	15/077,886	03-22-2016	US 2016-0314127 A1	10-27-2016	10,176,194	01-08-2019	Granted	DIGITALGLOBE, INC.
ESTIMATION OF COEFFICIENTS FOR A RATIONAL POLYNOMIAL CAMERA MODEL	United States	10/849,276	05-18-2004	US 2005-0259890 A1	11-24-2005	7,421,151	09-02-2008	Granted	DIGITALGLOBE, INC.
GENERATION OF HIGH RESOLUTION POPULATION DENSITY DATA SETS THROUGH EXPLOITATION OF HIGH RESOLUTION OVERHEAD IMAGERY DATA AND LOW RESOLUTION POPULATION DENSITY DATA SETS	United States	14/063,309	10-25-2013	US 2015-0063629 A1	03-05-2015	9,230,169	01-05-2016	Granted	DIGITALGLOBE, INC.

GENERATION OF HIGH RESOLUTION POPULATION DENSITY DATA SETS THROUGH EXPLOITATION OF HIGH RESOLUTION OVERHEAD IMAGERY DATA AND LOW RESOLUTION POPULATION DENSITY DATA SETS	United States	14/976,400	12-21-2015	US 2016-0188976 A1	06-30-2016	9,672,424	06-06-2017	Granted	DIGITALGLOBE, INC.
GLOBAL-SCALE DAMAGE DETECTION USING SATELLITE IMAGERY	United States	14/941,504	11-13-2015	US 2016-0078273 A1	03-17-2016	9,858,479	01-02-2018	Granted	DIGITALGLOBE, INC.
GLOBAL-SCALE OBJECT DETECTION USING SATELLITE IMAGERY	United States	14/810,382	07-27-2015	US 2016-0026848 A1	01-28-2016	9,922,265	03-20-2018	Granted	DIGITALGLOBE, INC.
IMAGE WARP	United States	11/835,169	08-07-2007			7,613,362	11-03-2009	Granted	DIGITALGLOBE, INC.
IMAGE WARP	United States	10/684,295	10-10-2003	US 2005-0078880 A1	04-14-2005	7,269,299	09-11-2007	Granted	DIGITALGLOBE, INC.
INTEGRATED ARCHITECTURE FOR NEAR-REAL-TIME SATELLITE IMAGING APPLICATIONS	United States	14/800,644	07-15-2015	US 2016-0020848 A1	01-21-2016	10,014,928	07-03-2018	Granted	DIGITALGLOBE, INC.
METHOD AND APPARATUS FOR DETERMINATION OF WATER PervIOUS SURFACES	United States	10/908,695	05-23-2005	US 2006-0262963 A1	11-23-2006	7,660,430	02-09-2010	Granted	DIGITALGLOBE, INC.
METHOD AND APPARATUS FOR ENHANCING A DIGITAL IMAGE	United States	12/463,797	05-11-2009	US 2009-0219407 A1	09-03-2009	7,715,651	05-11-2010	Granted	DIGITALGLOBE, INC.
MOVEMENT INTELLIGENCE USING SATELLITE IMAGERY	United States	16/709,673	12-10-2019	US 2020-0257881 A1	08-13-2020	11,275,939	03-15-2022	Granted	DIGITALGLOBE, INC.
MOVEMENT INTELLIGENCE USING SATELLITE IMAGERY	United States	15/241,034	08-18-2016	US 2017-0053155 A1	02-23-2017	10,089,528	10-02-2018	Granted	DIGITALGLOBE, INC.

MOVEMENT INTELLIGENCE USING SATELLITE IMAGERY	United States	16/150,177	10-02-2018	US 2019-0303647 A1	10-03-2019	10,503,975	12-10-2019	Granted	DIGITALGLOBE, INC.
MUDDY WATER DETECTION USING NORMALIZED SEMANTIC LAYERS	United States	15/694,353	09-01-2017	US 2018-0330488 A1	11-15-2018	10,515,272	12-24-2019	Granted	DIGITALGLOBE, INC.
MULTI-SPECTRAL IMAGE LABELING WITH RADIOMETRIC ATTRIBUTE VECTORS OF IMAGE SPACE REPRESENTATION COMPONENTS	United States	14/499,440	09-29-2014	US 2016-0093056 A1	03-31-2016	9,619,711	04-11-2017	Granted	DIGITALGLOBE, INC.
OBJECT DETECTION WITH TEXTURAL TO SPECTRAL DOMAIN ADAPTATION	United States	14/819,839	08-06-2015			9,495,618	11-15-2016	Granted	DIGITALGLOBE, INC.
OIL TANK FARM STORAGE MONITORING	United States	14/095,608	12-03-2013	US 2014-0363084 A1	12-11-2014	9,195,876	11-24-2015	Granted	DIGITALGLOBE, INC.
SEMI-AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM IMAGE DATA	United States	13/417,568	03-12-2012			8,488,845	07-16-2013	Granted	DIGITALGLOBE, INC.
SEMI-AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM IMAGE DATA	United States	11/764,765	06-18-2007			7,653,218	01-26-2010	Granted	DIGITALGLOBE, INC.
SEMI-AUTOMATIC EXTRACTION OF LINEAR FEATURES FROM IMAGE DATA	United States	12/606,918	10-27-2009			8,155,391	04-10-2012	Granted	DIGITALGLOBE, INC.
SENSOR SHIFT FOR REMOTE SENSING	United States	15/825,478	11-29-2017	US 2019-0161212 A1	05-30-2019	10,577,131	03-03-2020	Granted	DIGITALGLOBE, INC.
SENSOR SHIFT FOR REMOTE SENSING	United States	16/804,315	02-28-2020	US 2020-0407081 A1	12-31-2020			Allowed	DIGITALGLOBE, INC.

SOME AUTOMATED AND SEMI-AUTOMATED TOOLS FOR LINEAR FEATURE EXTRACTION IN TWO AND THREE DIMENSIONS	United States	15/802,313	11-02-2017	US 2018-0330187 A1	11-15-2018	10,372,984	08-06-2019	Granted	DIGITALGLOBE, INC.
SOME AUTOMATED AND SEMI-AUTOMATED TOOLS FOR LINEAR FEATURE EXTRACTION IN TWO AND THREE DIMENSIONS	United States	16/438,384	06-11-2019	US 2020-0005017 A1	01-02-2020	10,789,469	09-29-2020	Granted	DIGITALGLOBE, INC.
SOME AUTOMATED AND SEMI-AUTOMATED TOOLS FOR LINEAR FEATURE EXTRACTION IN TWO AND THREE DIMENSIONS	United States	17/037,305	09-29-2020	US 2021-0019495 A1	01-21-2021			Pending	DIGITALGLOBE, INC.
SOME AUTOMATED AND SEMI-AUTOMATED TOOLS FOR LINEAR FEATURE EXTRACTION IN TWO AND THREE DIMENSIONS	United States	14/730,176	06-03-2015	US 2015-0347867 A1	12-03-2015	9,727,784	08-08-2017	Granted	DIGITALGLOBE, INC.
SOME AUTOMATED AND SEMI-AUTOMATED TOOLS FOR LINEAR FEATURE EXTRACTION IN TWO AND THREE DIMENSIONS	United States	15/672,267	08-08-2017	US 2018-0129855 A1	05-10-2018	10,318,808	06-11-2019	Granted	DIGITALGLOBE, INC.
SPECTRAL DATA ANALYTIC CUBE CLASSIFIER (SPADACC) FOR CONTINUOUS WIDE AREA GEOSPATIAL MODELING USING NORMALIZED AND HIGHLY DIMENSIONAL MULTISPECTRAL RASTER DATA	United States	14/788,651	06-30-2015	US 2015-0379431 A1	12-31-2015	10,121,106	11-06-2018	Granted	DIGITALGLOBE, INC.
SHAPE-BASED SEGMENTATION USING HIERARCHICAL IMAGE REPRESENTATIONS FOR AUTOMATIC TRAINING DATA GENERATION AND SEARCH SPACE SPECIFICATION FOR MACHINE LEARNING ALGORITHMS	United States								



SYNTHESIZING TRAINING DATA FOR BROAD AREA GEOSPATIAL OBJECT DETECTION	United States	16/224,400	12-18-2018	US 2019-0385338 A1	12-19-2019	10,636,169	04-28-2020	Granted	DIGITALGLOBE, INC.
SYNTHESIZING TRAINING DATA FOR BROAD AREA GEOSPATIAL OBJECT DETECTION	United States	15/194,541	06-27-2016	US 2017-0061625 A1	03-02-2017	9,767,565	09-19-2017	Granted	DIGITALGLOBE, INC.
SYNTHESIZING TRAINING DATA FOR BROAD AREA GEOSPATIAL OBJECT DETECTION	United States	15/709,252	09-19-2017	US 2018-0158210 A1	06-07-2018	10,157,479	12-18-2018	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHOD FOR GEOLOCATION OF SOCIAL MEDIA POSTS	United States	13/840,173	03-15-2013	US 2014-0236916 A1	08-21-2014	9,032,000	05-12-2015	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHOD FOR LARGE SCALE CROWDSOURCING OF MAP DATA CLEANUP AND CORRECTION	United States	14/680,665	04-07-2015	US 2016-0004724 A1	01-07-2016	10,083,186	09-25-2018	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHOD FOR LARGE SCALE CROWDSOURCING OF MAP DATA CLEANUP AND CORRECTION	United States	16/507,012	07-09-2019	US 2020-0081932 A1	03-12-2020	11,294,981	04-05-2022	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHOD FOR LARGE SCALE CROWDSOURCING OF MAP DATA CLEANUP AND CORRECTION	United States	15/262,118	09-12-2016	US 2016-0378868 A1	12-29-2016	10,346,495	07-09-2019	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHOD FOR MULTI RESOLUTION AND MULTITEMPORAL IMAGE SEARCH	United States	14/091,412	11-27-2013	US 2014-0365463 A1	12-11-2014	9,529,824	12-27-2016	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHOD FOR MULTIREOLUTION AND MULTITEMPORAL IMAGE SEARCH	United States	15/391,786	12-27-2016	US 2017-0235767 A1	08-17-2017	10,482,122	11-19-2019	Granted	DIGITALGLOBE, INC.

SYSTEM AND METHODS FOR SEMI-AUTOMATED EDITING OF ORTHOMOSAICS BUILT FROM REMOTELY-SENSED IMAGERY	United States	16/182,367	11-06-2018	US 2019-0180102 A1	06-13-2019	10,474,895	11-12-2019	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHODS FOR SEMI-AUTOMATED EDITING OF ORTHOMOSAICS BUILT FROM REMOTELY-SENSED IMAGERY	United States	15/465,581	03-21-2017	US 2017-0300749 A1	10-19-2017	10,121,074	11-06-2018	Granted	DIGITALGLOBE, INC.
SYSTEM AND METHODS FOR SEMI-AUTOMATED EDITING OF ORTHOMOSAICS BUILT FROM REMOTELY-SENSED IMAGERY	United States	14/730,227	06-03-2015	US 2015-0339530 A1	11-26-2015	9,600,740	03-21-2017	Granted	DIGITALGLOBE, INC.
SYSTEM FOR SIMPLIFIED GENERATION OF SYSTEMS FOR BROAD AREA GEOSPATIAL OBJECT DETECTION	United States	16/533,386	08-06-2019	US 2020-0089930 A1	03-19-2020	10,803,310	10-13-2020	Granted	DIGITALGLOBE, INC.
SYSTEM FOR SIMPLIFIED GENERATION OF SYSTEMS FOR BROAD AREA GEOSPATIAL OBJECT DETECTION	United States	17/069,776	10-13-2020	US 2021-0027040 A1	01-28-2021			Pending	DIGITALGLOBE, INC.
SYSTEM FOR SIMPLIFIED GENERATION OF SYSTEMS FOR BROAD AREA GEOSPATIAL OBJECT DETECTION	United States	15/906,348	02-27-2018	US 2018-0189544 A1	07-05-2018	10,372,985	08-06-2019	Granted	DIGITALGLOBE, INC.
SYSTEM FOR SIMPLIFIED GENERATION OF SYSTEMS FOR BROAD AREA GEOSPATIAL OBJECT DETECTION	United States	15/608,894	05-30-2017	US 2017-0364733 A1	12-21-2017	9,904,849	02-27-2018	Granted	DIGITALGLOBE, INC.

TECHNIQUES FOR IDENTIFYING PARKING LOTS IN REMOTELY-SENSED IMAGES BY IDENTIFYING PARKING ROWS	United States	14/053,332	10-14-2013	US 2015-0104070 A1	04-16-2015	9,275,297	03-01-2016	Granted	DIGITALGLOBE, INC.
TECHNIQUES FOR IMAGE CO-REGISTRATION	United States	15/716,425	09-26-2017	US 2018-0089843 A1	03-29-2018	11,024,044	06-01-2021	Granted	DIGITALGLOBE, INC.
TONAL BALANCING OF MULTIPLE IMAGES	United States	11/753,272	05-24-2007			7,317,844	01-08-2008	Granted	DIGITALGLOBE, INC.
UNSUPERVISED LAND USE AND LAND COVER DETECTION	United States	15/812,124	11-14-2017	US 2018-0336394 A1	11-22-2018	10,691,942	06-23-2020	Granted	DIGITALGLOBE, INC.
USING PARALLAX IN REMOTE SENSING TO DETERMINE CLOUD FEATURE HEIGHT	United States	13/835,804	03-15-2013	US 2014-0268094 A1	09-18-2014	9,001,311	04-07-2015	Granted	DIGITALGLOBE, INC.
AUTOMATED CONCRETE/ASPHALT DETECTION BASED ON SENSOR TIME DELAY	United States	16/685,990	11-15-2019	US 2021-0150206 A1	05-20-2021			Allowed	MAXXAR INTELLIGENCE INC.
AUTOMATED PROCESS FOR BUILDING MATERIAL DETECTION IN REMOTELY SENSED MEMORY	United States	16/805,461	02-28-2020	US 2021-0272357 A1	09-02-2021			Pending	MAXXAR INTELLIGENCE INC.
AUTOMATED PROCESS FOR DYNAMIC MATERIAL CLASSIFICATION IN REMOTELY SENSED IMAGERY	United States	16/685,977	11-15-2019	US 2021-0150183 A1	05-20-2021	11,250,260	02-15-2022	Granted	MAXXAR INTELLIGENCE INC.
CLOUD DETECTION FROM SATELLITE IMAGERY	United States	16/685,609	11-15-2019	US 2021-0150182 A1	05-20-2021	11,010,606	05-18-2021	Granted	MAXXAR INTELLIGENCE INC.
ADAPTIVE COMMUNICATION SYSTEM	United States	15/710,740	09-20-2017	US 2019-0028197 A1	01-24-2019	10,707,961	07-07-2020	Granted	MAXXAR SPACE LLC
AGGREGATED SPACE SYSTEM NETWORK	United States	17/110,127	12-02-2020	US 2021-0281317 A1	09-09-2021			Pending	MAXXAR SPACE LLC

ATTITUDE RATE MITIGATION OF SPACECRAFT IN CLOSE PROXIMITY	United States	16/276,987	02-15-2019	US 2020-0262589 A1	08-20-2020			07-23-2019	Granted	MAXXAR SPACE LLC
CALIBRATION OF SATELLITE BEAMFORMING CHANNELS	United States	15/833,351	12-06-2017	US 2019-0173545 A1	06-06-2019	10,361,762		07-23-2019	Granted	MAXXAR SPACE LLC
COMMUNICATION PLATFORM WITH FLEXIBLE PHOTONICS PAYLOAD	United States	15/604,165	05-24-2017	US 2018-0048948 A1	02-15-2018	10,219,051		02-26-2019	Granted	MAXXAR SPACE LLC
DAYSIDE-ONLY ROLL STEERING	United States	17/076,444	10-21-2020	US 2021-0354857 A1	11-18-2021				Pending	MAXXAR SPACE LLC
FLEXIBLE BANDWIDTH ASSIGNMENT TO SPOT BEAMS	United States	17/204,033	03-17-2021	US 2021-0204269 A1	07-01-2021				Pending	MAXXAR SPACE LLC
FLEXIBLE BANDWIDTH ASSIGNMENT TO SPOT BEAMS	United States	16/163,105	10-17-2018	US 2019-0053214 A1	02-14-2019	10,986,641		04-20-2021	Granted	MAXXAR SPACE LLC
FLEXIBLE HIGH THROUGHPUT SATELLITE SYSTEM USING OPTICAL GATEWAYS	United States	15/633,007	06-26-2017	US 2018-0019816 A1	01-18-2018	10,320,481		06-11-2019	Granted	MAXXAR SPACE LLC
GROUND BASED SUBSYSTEMS, FOR INCLUSION IN OPTICAL GATEWAY, AND THAT INTERFACE WITH OPTICAL NETWORKS EXTERNAL TO OPTICAL GATEWAY	United States	15/461,381	03-16-2017	US 2018-0227054 A1	08-09-2018	10,122,456		11-06-2018	Granted	MAXXAR SPACE LLC
GROUND BASED SUBSYSTEMS, FOR INCLUSION IN OPTICAL GATEWAY, AND THAT INTERFACE WITH OPTICAL NETWORKS EXTERNAL TO OPTICAL GATEWAY	United States	16/168,658	10-23-2018	US 2019-0052561 A1	02-14-2019	10,476,595		11-12-2019	Granted	MAXXAR SPACE LLC

HIGH AVAILABILITY SCALABLE MULTISOURCE VIRTUALIZED SPECTRUM SIGNAL PROCESSING SYSTEM	United States	16/434,481	06-07-2019	US 2020-0244351 A1	07-30-2020			Pending	MAXXAR SPACE LLC
HIGH LINEARITY SATELLITE PAYLOAD USING SOLID STATE POWER AMPLIFIERS	United States	16/113,567	08-27-2018			10,511,377	12-17-2019	Granted	MAXXAR SPACE LLC
HIGH LINEARITY SATELLITE PAYLOAD USING SOLID STATE POWER AMPLIFIERS	United States	16/683,520	11-14-2019	US 2020-0091996 A1	03-19-2020	11,196,480	12-07-2021	Granted	MAXXAR SPACE LLC
HIGH THROUGHPUT SATELLITE SYSTEM WITH OPTICAL FEEDER UPLINK BEAMS AND RF SERVICE DOWNLINK BEAMS	United States	15/394,512	12-29-2016	US 2017-0366262 A1	12-21-2017	10,075,242	09-11-2018	Granted	MAXXAR SPACE LLC
METHOD AND APPARATUS FOR CALIBRATION AND EQUALIZATION OF MULTIPORT AMPLIFIERS (MPAS)	United States	15/628,140	06-20-2017	US 2020-0028475 A1	01-23-2020	10,541,656	01-21-2020	Granted	MAXXAR SPACE LLC
MULTI-MISSION CONFIGURABLE SPACECRAFT SYSTEM	United States	17/110,115	12-02-2020	US 2021-0303290 A1	09-30-2021			Pending	MAXXAR SPACE LLC
MULTIPORT AMPLIFIER INPUT NETWORK WITH COMPENSATION FOR OUTPUT NETWORK GAIN AND PHASE FREQUENCY RESPONSE IMBALANCE	United States	15/926,186	03-20-2018	US 2019-0173443 A1	06-06-2019	10,320,349	06-11-2019	Granted	MAXXAR SPACE LLC
MULTIPORT AMPLIFIER INPUT NETWORK WITH COMPENSATION FOR OUTPUT NETWORK GAIN AND PHASE FREQUENCY RESPONSE IMBALANCE	United States	16/405,162	05-07-2019	US 2019-0260340 A1	08-22-2019	10,673,399	06-02-2020	Granted	MAXXAR SPACE LLC

PROTECTED OVERLAY OF ASSIGNED FREQUENCY CHANNELS	United States	15/163,465	05-24-2016	US 2017-0214500 A1	07-27-2017	10,305,646	05-28-2019	Granted	MAXXAR SPACE LLC
SATELLITE DIVERSITY	United States	16/505,937	07-09-2019	US 2019-0335464 A1	10-31-2019	10,986,636	04-20-2021	Granted	MAXXAR SPACE LLC
SATELLITE DIVERSITY	United States	15/221,273	07-27-2016	US 2017-0215190 A1	07-27-2017	10,397,920	08-27-2019	Granted	MAXXAR SPACE LLC
SATELLITE NETWORK SWITCHING	United States	15/618,897	06-09-2017	US 2018-0359670 A1	12-13-2018	10,200,922	02-05-2019	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM BEAM TO BEAM HANDOVER	United States	15/173,083	06-03-2016	US 2018-0006712 A1	01-04-2018	10,128,578	11-13-2018	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM CALIBRATION IN ACTIVE OPERATIONAL CHANNELS	United States	15/0926,628	03-20-2018			10,284,308	05-07-2019	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM HAVING TERMINALS IN HOPPING BEAMS COMMUNICATING WITH MORE THAN ONE GATEWAY	United States	15/173,038	06-03-2016	US 2018-0006370 A1	01-04-2018	10,347,987	07-09-2019	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM USING AN RF GBBF FEEDER UPLINK BEAM FROM A GATEWAY TO A SATELLITE, AND USING AN OPTICAL ISL FROM THE SATELLITE TO ANOTHER SATELLITE	United States	16/111,008	08-23-2018			10,432,308	10-01-2019	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM USING OPTICAL GATEWAYS AND GROUND BASED BEAMFORMING	United States	15/682,785	08-22-2017	US 2018-0069629 A1	03-08-2018	10,142,021	11-27-2018	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM USING TIME DOMAIN BEAM HOPPING	United States	15/172,825	06-03-2016	US 2017-0289822 A1	10-05-2017	10,111,109	10-23-2018	Granted	MAXXAR SPACE LLC

SATELLITE SYSTEM WITH BEAM HOPPING PLAN THAT TAKES INTO ACCOUNT THE NEEDS OF GATEWAYS AND SUBSCRIBER TERMINALS	United States	15/173,054	06-03-2016	US 2018-0006714 A1	01-04-2018	10,135,154	11-20-2018	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM WITH DIFFERENT FREQUENCY PLAN AT THE EQUATOR	United States	15/172,882	06-03-2016	US 2017-0290012 A1	10-05-2017	10,128,577	11-13-2018	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM WITH HANDOVER FOR MULTIPLE GATEWAYS	United States	15/173,097	06-03-2016	US 2018-0006713 A1	01-04-2018	10,381,748	08-13-2019	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM WITH ROLLING WAVE HANDOVERS	United States	15/218,009	07-23-2016	US 2018-0097561 A1	04-05-2018	10,225,002	03-05-2019	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM WITH SINGLE POLARIZATION PATH	United States	15/172,965	06-03-2016	US 2018-0006382 A1	01-04-2018	10,594,046	03-17-2020	Granted	MAXXAR SPACE LLC
SATELLITE SYSTEM WITH STEERABLE GATEWAY BEAMS	United States	15/172,978	06-03-2016	US 2018-0006711 A1	01-04-2018	10,418,724	09-17-2019	Granted	MAXXAR SPACE LLC
SATELLITE WITH REGENERATIVE PROCESSOR	United States	15/799,258	10-31-2017	US 2019-0132044 A1	05-02-2019	10,797,784	10-06-2020	Granted	MAXXAR SPACE LLC
SYNCHRONIZATION FOR SATELLITE SYSTEM	United States	15/172,859	06-03-2016	US 2017-0289939 A1	10-05-2017	10,411,362	09-10-2019	Granted	MAXXAR SPACE LLC
A DIELECTRIC RESONATOR FILTER AND MULTIPLEXER HAVING A COMMON WALL WITH A CENTRALLY LOCATED COUPLING IRIS AND A LARGER PERIPHERAL APERTURE ADJUSTABLE BY A TUNING SCREW	United States	14/681,920	04-08-2015	US 2016-0301123 A1	10-13-2016	9,705,171	07-11-2017	Granted	SPACE SYSTEMS/LORAL, LLC <sup>2</sup>

<sup>2</sup> Space Systems/Loral, LLC is a prior name of Maxar Space LLC. Company to update record ownership.

ACCESS SWITCH NETWORK WITH REDUNDANCY	United States	15/267,828	09-16-2016	US 2018-0083693 A1	03-22-2018	10,284,283	05-07-2019	Granted	SPACE SYSTEMS/LORAL, LLC
ADDITIVE MANUFACTURED RF MODULE	United States	15/818,542	11-20-2017	US 2019-0036193 A1	01-31-2019	10,573,949	02-25-2020	Granted	SPACE SYSTEMS/LORAL, LLC
ADDITIVE MANUFACTURING ON-ORBIT	United States	15/885,484	01-31-2018			11,014,303	05-25-2021	Granted	SPACE SYSTEMS/LORAL, LLC
ALL FRONT CONTACT SOLAR CELL	United States	14/734,996	06-09-2015	US 2016-0365468 A1	12-15-2016	10,096,726	10-09-2018	Granted	SPACE SYSTEMS/LORAL, LLC
AMPLIFIER INTEGRATED FEED ARRAY WITH MODULARIZED FEED ELEMENTS AND AMPLIFIERS	United States	15/699,909	09-08-2017	US 2018-0131081 A1	05-10-2018	10,566,684	02-18-2020	Granted	SPACE SYSTEMS/LORAL, LLC
ANTENNA ARRAY WITH REDUCED MUTUAL COUPLING BETWEEN ARRAY ELEMENTS	United States	13/896,181	05-16-2013	US 2014-0340271 A1	11-20-2014	9,537,209	01-03-2017	Granted	SPACE SYSTEMS/LORAL, LLC
ANTENNA DISTORTION ESTIMATION AND COMPENSATION	United States	10/244,944	09-17-2002	US 2004-0051662 A1	03-18-2004	6,720,918	04-13-2004	Granted	SPACE SYSTEMS/LORAL, LLC
ANTENNA SYSTEM WITH MULTIPLE INDEPENDENTLY STERABLE SHAPED BEAMS	United States	13/240,079	09-22-2011			9,774,095	09-26-2017	Granted	SPACE SYSTEMS/LORAL, LLC
ANTENNA TRACKING PROFILE ESTIMATION	United States	12/779,872	05-13-2010			8,179,313	05-15-2012	Granted	SPACE SYSTEMS/LORAL, LLC
ARTICULATING SUNSHIELD	United States	15/586,076	05-03-2017			10,618,677	04-14-2020	Granted	SPACE SYSTEMS/LORAL, LLC



ARTICULATION TECHNIQUES FOR A SPACECRAFT SOLAR ARRAY	United States	15/263,209	09-12-2016			10,435,182	10-08-2019	Granted	SPACE SYSTEMS/LORAL, LLC
ASYMMETRIC THRUSTER GIMBAL CONFIGURATION	United States	15/467,612	03-23-2017			10,464,694	11-05-2019	Granted	SPACE SYSTEMS/LORAL, LLC
AXIALLY GROOVED CROSSING HEAT PIPES	United States	14/097,020	12-04-2013			9,352,856	05-31-2016	Granted	SPACE SYSTEMS/LORAL, LLC
BAND CLAMP WITH REDUNDANT LOAD PATH	United States	13/164,414	06-20-2011	US 2012-0317753 A1	12-20-2012	8,732,916	05-27-2014	Granted	SPACE SYSTEMS/LORAL, LLC
BATTERY CHARGE MANAGEMENT FOR GEOSYNCHRONOUS SPACECRAFT	United States	14/973,186	12-17-2015			10,239,477	03-26-2019	Granted	SPACE SYSTEMS/LORAL, LLC
BROADBAND SATELLITE PAYLOAD ARCHITECTURE	United States	14/685,302	04-13-2015	US 2015-0295640 A1	10-15-2015	10,270,524	04-23-2019	Granted	SPACE SYSTEMS/LORAL, LLC
BROADBAND SATELLITE WITH DUAL FREQUENCY CONVERSION AND BANDWIDTH AGGREGATION	United States	13/093,669	04-25-2011	US 2012-0094593 A1	04-19-2012	8,660,482	02-25-2014	Granted	SPACE SYSTEMS/LORAL, LLC
CAGING MECHANISM FOR A SINGLE- OR MULTI-AXIS POSITIONING MECHANISM	United States	14/089,067	11-25-2013			9,677,602	06-13-2017	Granted	SPACE SYSTEMS/LORAL, LLC
CDMA CODE ADDRESS DATA ROUTING SYSTEM AND METHOD	United States	10/094,898	03-11-2002	US 2003-0179732 A1	09-25-2003	6,725,277	04-20-2004	Expired	SPACE SYSTEMS/LORAL, LLC
CHANNELIZER SUPPLEMENTED SPACECRAFT TELEMETRY AND COMMAND FUNCTIONALITY	United States	14/939,433	11-12-2015			9,621,255	04-11-2017	Granted	SPACE SYSTEMS/LORAL, LLC

CHANNELIZER SUPPLEMENTED SPACECRAFT TELEMETRY AND COMMAND FUNCTIONALITY	United States	15/445,797	02-28-2017	US 2017-0180037 A1	06-22-2017	10,033,455	07-24-2018	Granted	SPACE SYSTEMS/LORAL, LLC
CLOUD MASK DATA ACQUISITION AND DISTRIBUTION USING GEOSYNCHRONOUS COMMUNICATIONS OR BROADCAST SATELLITES	United States	15/247,052	08-25-2016	US 2018-0062735 A1	03-01-2018	10,230,454	03-12-2019	Granted	SPACE SYSTEMS/LORAL, LLC
COMMUNICATION SYSTEM WITH MULTI BAND GATEWAY	United States	14/659,222	03-16-2015	US 2016-0277990 A1	09-22-2016	9,967,792	05-08-2018	Granted	MAXXAR SPACE LLC
COMPACT MICROSTRIP HYBRID COUPLED INPUT MULTIPLEXER	United States	13/870,761	04-25-2013			8,761,026	06-24-2014	Granted	SPACE SYSTEMS/LORAL, LLC
CROSS-FEEDING PROPELLANT BETWEEN STACKED SPACECRAFT	United States	15/616,803	06-07-2017	US 2018-0354659 A1	12-13-2018	10,589,879	03-17-2020	Granted	SPACE SYSTEMS/LORAL, LLC
CURRENT COLLECTOR BAR AND GRID PATTERN FOR A PHOTOVOLTAIC SOLAR CELL	United States	13/189,354	07-22-2011	US 2013-0019919 A1	01-24-2013	9,000,288	04-07-2015	Granted	SPACE SYSTEMS/LORAL, LLC
DEPLOYABLE PROPULSION MODULE FOR SPACECRAFT	United States	15/488,179	04-14-2017			10,435,183	10-08-2019	Granted	SPACE SYSTEMS/LORAL, LLC
DEPRESSURIZATION TEST METHOD USING PRESSURE VESSEL	United States	14/222,136	03-21-2014			9,606,044	03-28-2017	Granted	SPACE SYSTEMS/LORAL, LLC
DIGITAL BEAMFORMING ARCHITECTURE	United States	15/225,525	08-01-2016			9,917,623	03-13-2018	Granted	SPACE SYSTEMS/LORAL, LLC
DIGITAL PAYLOAD WITH VARIABLE HIGH POWER AMPLIFIERS	United States	14/965,620	12-10-2015	US 2017-0041065 A1	02-09-2017	10,312,995	06-04-2019	Granted	SPACE SYSTEMS/LORAL, LLC
DUAL MODE DIELECTRIC RESONATOR OPERATING IN A HE MODE WITH A Q	United States	13/247,243	09-28-2011	US 2013-0076459 A1	03-28-2013	8,952,769	02-10-2015	Granted	SPACE SYSTEMS/LORAL, LLC

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DUAL-POLARIZED, DUAL-BAND, COMPACT BEAM FORMING NETWORK	United States	14/968,725	12-14-2015	US 2017-0170561 A1	06-15-2017	10,033,099	07-24-2018	Granted	SPACE SYSTEMS/LORAL, LLC
DYNAMIC LINK ADAPTION AND/OR DYNAMIC ALLOCATION OF COMMUNICATION RESOURCES OF A COMMUNICATION SYSTEM BASED ON EXTERNAL INTERFERENCE INFORMATION RECEIVED FROM EXTERNAL INTERFERENCE INFORMATION SOURCES	United States	14/632,482	02-26-2015	US 2016-0254854 A1	09-01-2016	9,628,168	04-18-2017	Granted	MAXXAR SPACE LLC
ECLIPITIC SUN ACQUISITION CONTROL MODE FOR SATELLITES	United States	15/603,288	05-23-2017	US 2018-0339792 A1	11-29-2018	10,538,342	01-21-2020	Granted	SPACE SYSTEMS/LORAL, LLC
EFFICIENT ORBITAL STORAGE AND DEPLOYMENT FOR SPACECRAFT IN INCLINED GEOSYNCHRONOUS ORBIT	United States	15/441,040	02-23-2017	US 2017-0247125 A1	08-31-2017	10,329,034	06-25-2019	Granted	SPACE SYSTEMS/LORAL, LLC

EFFICIENT STATIONKEEPING STRATEGY FOR THE THREE APOGEE (TAP) ORBIT	United States	15/352,471	11-15-2016			10,364,051	07-30-2019	Granted	SPACE SYSTEMS/LORAL, LLC
ELECTRIC THRUSTER WASTE HEAT RECOVERY DURING SATELLITE ORBIT TRANSFER	United States	15/470,592	03-27-2017	US 2018-0273215 A1	09-27-2018	10,538,346	01-21-2020	Granted	SPACE SYSTEMS/LORAL, LLC
ELECTRICALLY LARGE STEPPED-WALL AND SMOOTH-WALL HORNS FOR SPOT BEAM APPLICATIONS	United States	12/928,135	12-03-2010	US 2012-0139807 A1	06-07-2012	9,136,606	09-15-2015	Granted	SPACE SYSTEMS/LORAL, LLC
ELECTROSTATIC DISCHARGE CONTROL FOR A MULTI-CAVITY MICROWAVE FILTER	United States	13/442,252	04-09-2012	US 2013-0265119 A1	10-10-2013	8,907,742	12-09-2014	Granted	SPACE SYSTEMS/LORAL, LLC
ENHANCED RADIATOR	United States	17/180,615	02-19-2021	US 2021-0171224 A1	06-10-2021			Pending	SPACE SYSTEMS/LORAL, LLC
EXOSKELETAL LAUNCH SUPPORT STRUCTURE	United States	15/480,276	04-05-2017	US 2018-0290771 A1	10-11-2018	10,633,123	04-28-2020	Granted	SPACE SYSTEMS/LORAL, LLC
EXTENDABLE ANTENNA REFLECTOR DEPLOYMENT TECHNIQUES	United States	13/215,929	08-23-2011			9,004,409	04-14-2015	Granted	SPACE SYSTEMS/LORAL, LLC
FLEXIBLE ARRAY SUPPORT STRUCTURE	United States	13/729,848	12-28-2012			8,894,017	11-25-2014	Granted	SPACE SYSTEMS/LORAL, LLC
FLEXIBLE BANDWIDTH ASSIGNMENT TO SPOT BEAMS	United States	15/144,487	05-02-2016	US 2017-0215176 A1	07-27-2017	10,136,438	11-20-2018	Granted	MAXXAR SPACE LLC
FLEXIBLE PROPULSION SYSTEM	United States	14/937,208	11-10-2015			10,336,475	07-02-2019	Granted	SPACE SYSTEMS/LORAL, LLC

FLEXIBLE RADIATION SHIELD	United States	14/954,583	11-30-2015			9,640,288	05-02-2017	Granted	SPACE SYSTEMS/LORAL, LLC
FLEXIBLE RADIO FREQUENCY CONVERTERS FOR DIGITAL PAYLOADS	United States	15/372,276	12-07-2016			10,577,130	03-03-2020	Granted	SPACE SYSTEMS/LORAL, LLC
FLEXIBLE SIGNAL DISTRIBUTION ASSISTED BY TUNABLE OPTICAL CARRIER MODULATING A DESIRED SIGNAL	United States	15/904,063	02-23-2018			10,250,330	04-02-2019	Granted	MAXAR SPACE LLC
FREQUENCY AND BANDWIDTH TUNABLE MICROWAVE FILTER	United States	13/644,632	10-04-2012			9,019,039	04-28-2015	Granted	SPACE SYSTEMS/LORAL, LLC
GROUND-BASED BEAMFORMING FOR SATELLITE COMMUNICATIONS SYSTEMS	United States	11/467,490	08-25-2006	US 2008-0051080 A1	02-28-2008	7,787,819	08-31-2010	Granted	SPACE SYSTEMS/LORAL, LLC
GROUND-BASED BEAMFORMING FOR SATELLITE COMMUNICATIONS SYSTEMS	United States	12/856,468	08-13-2010	US 2010-0302971 A1	12-02-2010	8,270,899	09-18-2012	Granted	SPACE SYSTEMS/LORAL, LLC
HEAT PIPE AND RADIATOR SYSTEM WITH THERMOELECTRIC COOLER	United States	14/183,263	02-18-2014			9,714,777	07-25-2017	Granted	SPACE SYSTEMS/LORAL, LLC
HIGH CAPACITY BROADBAND SATELLITE	United States	13/101,944	05-05-2011	US 2012-0068019 A1	03-22-2012	8,789,796	07-29-2014	Granted	SPACE SYSTEMS/LORAL, LLC

HIGH CAPACITY COMMUNICATION SATELLITE	United States	15/887,721	02-02-2018	US 2018-0370657 A1	12-27-2018	10,800,551	10-13-2020	Granted	SPACE SYSTEMS/LORAL, LLC
HIGH CAPACITY SPACECRAFT	United States	14/939,445	11-12-2015			10,183,764	01-22-2019	Granted	SPACE SYSTEMS/LORAL, LLC
HIGH POINTING ACCURACY SPACECRAFT	United States	15/709,341	09-19-2017			10,367,575	07-30-2019	Granted	SPACE SYSTEMS/LORAL, LLC
HIGH THROUGHPUT SATELLITE SYSTEM WITH RF SERVICE UPLINK BEAMS AND OPTICAL FEEDER DOWNLINK BEAMS	United States	15/394,602	12-29-2016	US 2017-0366263 A1	12-21-2017	9,917,646	03-13-2018	Granted	MAXAR SPACE LLC
HIGH-FREQUENCY CAVITY RESONATOR FILTER WITH DIAMETRICALLY-OPPOSED HEAT TRANSFER LEGS	United States	14/864,669	09-24-2015	US 2017-0093004 A1	03-30-2017	10,056,668	08-21-2018	Granted	SPACE SYSTEMS/LORAL, LLC
HIGHLY INCLINED ELLIPTICAL ORBIT DE-ORBIT TECHNIQUES	United States	14/300,032	06-09-2014	US 2015-0353209 A1	12-10-2015	9,550,585	01-24-2017	Granted	SPACE SYSTEMS/LORAL, LLC
HIGHLY INCLINED ELLIPTICAL ORBIT DE-ORBIT TECHNIQUES	United States	15/261,696	09-09-2016			10,202,207	02-12-2019	Granted	SPACE SYSTEMS/LORAL, LLC
HIGHLY INCLINED ELLIPTICAL ORBIT LAUNCH AND ORBIT ACQUISITION TECHNIQUES	United States	14/300,027	06-09-2014	US 2015-0353208 A1	12-10-2015	9,365,299	06-14-2016	Granted	SPACE SYSTEMS/LORAL, LLC
HIGHLY INCLINED ELLIPTICAL ORBIT LAUNCH AND ORBIT ACQUISITION TECHNIQUES	United States	15/166,033	05-26-2016			9,533,774	01-03-2017	Granted	SPACE SYSTEMS/LORAL, LLC

HINGE WITH SPRING PRE-LOAD TRANSFER MECHANISM	United States	14/596,096	01-13-2015	US 2016- 0201372 A1	07-14-2016	9,546,510	01-17-2017	Granted	SPACE SYSTEMS/LORAL, LLC
HOLD-DOWN MECHANISM FOR A SPACECRAFT APPENDAGE	United States	13/237,761	09-20-2011			8,915,473	12-23-2014	Granted	SPACE SYSTEMS/LORAL, LLC
IMAGE NAVIGATION METHOD USING PARAMETRIC SYSTEMATIC ERROR CORRECTION	United States	12/800,450	05-14-2010	US 2010- 0228481 A1	09-09-2010	8,301,377	10-30-2012	Granted	SPACE SYSTEMS/LORAL, LLC
IMAGING ARRAY FED REFLECTOR	United States	15/438,620	02-21-2017	US 2018- 0013204 A1	01-11-2018	10,305,195	05-28-2019	Granted	SPACE SYSTEMS/LORAL, LLC
INCLINED GEOSYNCHRONOUS ORBIT SPACECRAFT CONSTELLATIONS	United States	15/441,032	02-23-2017	US 2017- 0247123 A1	08-31-2017	10,889,388	01-12-2021	Granted	SPACE SYSTEMS/LORAL, LLC
INCREMENTAL DEPLOYMENT DEVICE	United States	14/596,101	01-13-2015	US 2016- 0201778 A1	07-14-2016	10,337,594	07-02-2019	Granted	SPACE SYSTEMS/LORAL, LLC
INTEGRAL CORNER BYPASS DIODE INTERCONNECTING CONFIGURATION FOR MULTIPLE SOLAR CELLS	United States	14/092,775	11-27-2013	US 2015- 0144173 A1	05-28-2015	9,627,565	04-18-2017	Granted	SPACE SYSTEMS/LORAL, LLC
LATTICE STRUCTURE DESIGN AND MANUFACTURING TECHNIQUES	United States	15/622,888	06-14-2017	US 2018- 0366833 A1	12-20-2018	10,326,209	06-18-2019	Granted	SPACE SYSTEMS/LORAL, LLC
LOW COST LAUNCH VEHICLE FAIRING	United States	15/277,505	09-27-2016			10,214,303	02-26-2019	Granted	SPACE SYSTEMS/LORAL, LLC
LOW EARTH ORBITTING SPACECRAFT WITH A DUAL-USE DIRECTIONAL ANTENNA	United States	15/900,653	02-20-2018	US 2018- 0288374 A1	10-04-2018	10,536,674	01-14-2020	Granted	SPACE SYSTEMS/LORAL, LLC

MICROSTRIP MANIFOLD COUPLED MULTIPLEXER	United States	13/340,095	12-29-2011	US 2013-0169379 A1	07-04-2013	9,030,271	05-12-2015	Granted	SPACE SYSTEMS/LORAL, LLC
MODE FILTER	United States	13/800,365	03-13-2013	US 2014-0266961 A1	09-18-2014	9,531,048	12-27-2016	Granted	SPACE SYSTEMS/LORAL, LLC
MODULARIZED FEED ARRAY ARRANGEMENT	United States	15/831,258	12-04-2017	US 2018-0301800 A1	10-18-2018	10,263,325	04-16-2019	Granted	SPACE SYSTEMS/LORAL, LLC
MULTI-BEAM SATELLITE NETWORK TO MAXIMIZE BANDWIDTH UTILIZATION	United States	11/891,086	08-08-2007			7,792,070	09-07-2010	Granted	SPACE SYSTEMS/LORAL, LLC
MULTI-CHANNEL SATELLITE ANTENNA CALIBRATION	United States	15/470,600	03-27-2017	US 2018-0034541 A1	02-01-2018	10,044,436	08-07-2018	Granted	SPACE SYSTEMS/LORAL, LLC
MULTI-CHANNEL SATELLITE CALIBRATION	United States	15/225,588	08-01-2016			9,642,107	05-02-2017	Granted	SPACE SYSTEMS/LORAL, LLC
MULTIPLE THRUSTER FIRING ON A SINGLE ARTICULABLE MODULE	United States	15/920,294	03-13-2018			11,155,368	10-26-2021	Granted	SPACE SYSTEMS/LORAL, LLC
MULTI-PORT AMPLIFIERS (MPAS) USING OUTPUT FILTERING TO IMPROVE PERFORMANCE OVER LIFE	United States	15/364,115	11-29-2016	US 2017-0229765 A1	08-10-2017	10,320,064	06-11-2019	Granted	SPACE SYSTEMS/LORAL, LLC
NAVIGATIONAL ROUTE SELECTION TO MITIGATE PROBABILITY MOBILE TERMINAL LOSSES COMMUNICATION CAPABILITY	United States	14/632,492	02-26-2015	US 2016-0252350 A1	09-01-2016	9,476,715	10-25-2016	Granted	MAXAR SPACE LLC



NON-BLOCKING SWITCH MATRIX	United States	14/989,612	01-06-2016			10,109,441	10-23-2018	Granted	SPACE SYSTEMS/LORAL, LLC
NONDESTRUCTIVE PROOF LOADING OF HONEYCOMB PANELS	United States	14/448,744	07-31-2014			9,523,633	12-20-2016	Granted	SPACE SYSTEMS/LORAL, LLC
ON-ORBIT ASSEMBLY OF COMMUNICATION SATELLITES	United States	14/642,486	03-09-2015	US 2016-0264264 A1	09-15-2016	9,878,806	01-30-2018	Granted	SPACE SYSTEMS/LORAL, LLC
ON-ORBIT ASSEMBLY OF COMMUNICATION SATELLITES	United States	15/847,780	12-19-2017	US 2018-0111704 A1	04-26-2018	10,518,909	12-31-2019	Granted	SPACE SYSTEMS/LORAL, LLC
ON-ORBIT PROPELLANT METERING AND REFUELING	United States	15/809,856	11-10-2017			10,926,892	02-23-2021	Granted	SPACE SYSTEMS/LORAL, LLC
ORTHOMODE TRANSDUCER	United States	15/180,444	06-13-2016			9,947,978	04-17-2018	Granted	SPACE SYSTEMS/LORAL, LLC
POINTING SYSTEM IMPROVEMENT WITH IMAGING ARRAY FEEDS	United States	15/831,257	12-04-2017			10,461,409	10-29-2019	Granted	SPACE SYSTEMS/LORAL, LLC
POWER TRAIN FOR DEEP SPACE SOLAR ELECTRIC PROPULSION	United States	15/659,395	07-25-2017			10,954,005	03-23-2021	Granted	SPACE SYSTEMS/LORAL, LLC
PRE AND POST ORBIT MANEUVER PULSES TO REDUCE FLEXURAL OSCILLATIONS	United States	14/972,736	12-17-2015			10,501,211	12-10-2019	Granted	SPACE SYSTEMS/LORAL, LLC
QUADRATURE AMPLITUDE MODULATION SYSTEM WITH COMPENSATION FOR TRANSMISSION SYSTEM CHARACTERISTICS	United States	07/907,151	07-01-1992			5,237,292	08-17-1993	Expired	SPACE SYSTEMS/LORAL, LLC

RADIAL RELEASE DEVICE	United States	12/082,818	04-14-2008	US 2010-0005913 A1	01-14-2010	8,568,053	10-29-2013	Granted	SPACE SYSTEMS/LORAL, LLC
RADIAL RELEASE DEVICE	United States	14/012,915	08-28-2013	US 2014-0016992 A1	01-16-2014	9,708,082	07-18-2017	Granted	SPACE SYSTEMS/LORAL, LLC
RECONFIGURABLE SPACECRAFT WITH A HOLD-DOWN ASSEMBLY FOR A RIGID REFLECTOR	United States	15/669,470	08-04-2017	US 2019-0044245 A1	02-07-2019	10,957,986	03-23-2021	Granted	SPACE SYSTEMS/LORAL, LLC
REDUNDANT FUSE WIRE RELEASE DEVICE	United States	13/068,655	05-17-2011	US 2012-0293294 A1	11-22-2012	9,085,377	07-21-2015	Granted	SPACE SYSTEMS/LORAL, LLC
REDUNDANT RADIAL RELEASE APPARATUS	United States	12/215,041	06-23-2008	US 2009-0317174 A1	12-24-2009	8,021,069	09-20-2011	Granted	SPACE SYSTEMS/LORAL, LLC
REDUNDANT TELEMETRY TRANSMISSION PATH	United States	14/670,141	03-26-2015	US 2016-0285543 A1	09-29-2016	10,236,970	03-19-2019	Granted	SPACE SYSTEMS/LORAL, LLC
REFLECTIVE AND PERMEABLE METALLIZED LAMINATE	United States	14/161,343	01-22-2014			9,685,710	06-20-2017	Granted	SPACE SYSTEMS/LORAL, LLC
REFLECTOR DEPLOYMENT TECHNIQUES FOR SATELLITES	United States	13/215,932	08-23-2011			9,248,922	02-02-2016	Granted	SPACE SYSTEMS/LORAL, LLC
REVERSE WIRELESS BROADBAND SYSTEM	United States	14/820,408	08-06-2015	US 2017-0041066 A1	02-09-2017	9,979,466	05-22-2018	Granted	SPACE SYSTEMS/LORAL, LLC
RF FEED ELEMENT DESIGN OPTIMIZATION USING SECONDARY PATTERN	United States	13/170,813	06-28-2011	US 2013-0006585 A1	01-03-2013	8,914,258	12-16-2014	Granted	SPACE SYSTEMS/LORAL, LLC
ROLL-UP CONTAMINATION COVER	United States	13/665,717	10-31-2012			8,973,641	03-10-2015	Granted	SPACE SYSTEMS/LORAL, LLC

ROTATABLE STACKED SPACECRAFT	United States	15/488,166	04-14-2017			10,479,534	11-19-2019	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE CONSTELLATION SWITCHING	United States	15/388,269	12-22-2016			9,882,632	01-30-2018	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE HAVING MULTIPLE ASPECT RATIOS	United States	13/026,175	02-11-2011	US 2012-0205492 A1	08-16-2012	8,448,902	05-28-2013	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE ORBIT RAISING USING ELECTRIC PROPULSION	United States	12/925,386	10-20-2010	US 2012-0097796 A1	04-26-2012	9,108,748	08-18-2015	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE SYSTEM RESOURCE ALLOCATION OPTIMIZATION	United States	13/793,922	03-11-2013			8,996,051	03-31-2015	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE SYSTEM THAT PRODUCES OPTICAL INTER-SATELLITE LINK (ISL) BEAM BASED ON OPTICAL FEEDER UPLINK BEAM	United States	15/461,369	03-16-2017	US 2018-0019807 A1	01-18-2018	9,979,465	05-22-2018	Granted	MAXAR SPACE LLC
SATELLITE SYSTEM THAT PRODUCES OPTICAL INTER-SATELLITE LINK (ISL) BEAM BASED ON OPTICAL ISL RECEIVED FROM ANOTHER SATELLITE	United States	15/461,372	03-16-2017	US 2018-0019808 A1	01-18-2018	10,050,699	08-14-2018	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE SYSTEM THAT PRODUCES OPTICAL INTER-SATELLITE LINK (ISL) BEAM BASED ON RF FEEDER UPLINK BEAM	United States	15/461,377	03-16-2017	US 2018-0019809 A1	01-18-2018	9,923,625	03-20-2018	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE SYSTEM USING OPTICAL GATEWAYS AND ONBOARD PROCESSING	United States	15/599,852	05-19-2017	US 2018-0041275 A1	02-08-2018	10,069,565	09-04-2018	Granted	SPACE SYSTEMS/LORAL, LLC

SATELLITE SYSTEM WITH ENHANCED PAYLOAD CAPACITY	United States	12/344,064	12-24-2008			8,135,338	03-13-2012	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE TRANSMIT ANTENNA GROUND-BASED POINTING	United States	15/092,413	4/6/2016			9,608,716	03-28-2017	Granted	SPACE SYSTEMS/LORAL, LLC
SATELLITE WITH TRANSITION BEAM SIZE	United States	14/875,491	10-05-2015	US 2017-0099095 A1	04-06-2017	9,705,586	07-11-2017	Granted	SPACE SYSTEMS/LORAL, LLC
SELF-ASSEMBLING PERSISTENT SPACE PLATFORM	United States	15/689,993	08-29-2017	US 2018-0093786 A1	04-05-2018	10,661,918	05-26-2020	Granted	SPACE SYSTEMS/LORAL, LLC
SELF-ASSEMBLING PERSISTENT SPACE PLATFORM	United States	16/855,356	04-22-2020	US 2020-0247563 A1	08-06-2020			Pending	SPACE SYSTEMS/LORAL, LLC
SELF-BALANCING SOLAR ARRAY	United States	14/918,337	10-20-2015			10,618,678	04-14-2020	Granted	SPACE SYSTEMS/LORAL, LLC
SHAPE MEMORY ALLOY PRE-LOADED DEPLOYMENT HINGE	United States	13/665,722	10-31-2012			8,876,062	11-04-2014	Granted	SPACE SYSTEMS/LORAL, LLC
SIDE-BY-SIDE MULTIPLE LAUNCH CONFIGURATION	United States	14/108,213	12-16-2013	US 2015-0102174 A1	04-16-2015	9,242,743	01-26-2016	Granted	SPACE SYSTEMS/LORAL, LLC
SMALLSAT PAYLOAD CONFIGURATION	United States	15/351,233	11-14-2016			10,538,347	01-21-2020	Granted	SPACE SYSTEMS/LORAL, LLC
SMALLSAT PAYLOAD CONFIGURATION	United States	16/748,617	01-21-2020	US 2021-0122501 A1	04-29-2021	11,254,453	02-22-2022	Granted	SPACE SYSTEMS/LORAL, LLC
SOLAR CELL ASSEMBLY	United States	09/346,272	07-01-1999			6,034,322	03-07-2000	Expired	SPACE SYSTEMS/LORAL, LLC
SOLAR PANEL SEQUENCING MECHANISM	United States	13/624,410	09-21-2012			8,915,474	12-23-2014	Granted	SPACE SYSTEMS/LORAL, LLC
SOLID STATE TRAVELING WAVE AMPLIFIER FOR SPACE APPLICATIONS	United States	14/729,883	06-03-2015	US 2016-0359464 A1	12-08-2016	9,641,144	05-02-2017	Granted	SPACE SYSTEMS/LORAL, LLC

SOURCE DRIVER CURRENT FOLD-BACK PROTECTION	United States	13/053,084	03-21-2011	US 2012-0242304 A1	09-27-2012	8,482,894	07-09-2013	Granted	SPACE SYSTEMS/LORAL, LLC
SPACE BASED ROBOTIC ASSEMBLY OF A MODULAR REFLECTOR	United States	15/654,593	07-19-2017			10,730,643	08-04-2020	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT DESIGN WITH MULTIPLE THERMAL ZONES	United States	15/466,610	03-22-2017			10,780,998	09-22-2020	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT EXOSKELETON TRUSS STRUCTURE	United States	15/336,541	10-27-2016			10,407,189	09-10-2019	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT HAVING A MOMENTUM WHEEL CONFIGURATION THAT PREVENTS ZERO WHEEL SPEEDS	United States	09/995,017	11-27-2001	US 2003-0098393 A1	05-29-2003	6,691,955	02-17-2004	Expired	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT MOMENTUM MANAGEMENT	United States	13/326,654	12-15-2011	US 2012-0097797 A1	04-26-2012	9,108,749	08-18-2015	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT MOMENTUM MANAGEMENT USING SOLAR ARRAY	United States	13/115,370	05-25-2011	US 2012-0303185 A1	11-29-2012	8,868,263	10-21-2014	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT MOMENTUM UNLOAD AND STATION-KEEPING TECHNIQUES	United States	13/683,887	11-21-2012	US 2014-0138491 A1	05-22-2014	8,998,146	04-07-2015	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT PAYLOAD ORIENTATION STERLING	United States	12/629,707	12-02-2009	US 2010-0179711 A1	07-15-2010	9,045,239	06-02-2015	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT PAYLOAD POSITIONING WITH RESPECT TO A VIRTUAL PIVOT POINT	United States	13/044,278	03-09-2011	US 2012-0228436 A1	09-13-2012	8,800,935	08-12-2014	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT PROPELLANT MANAGEMENT SYSTEM	United States	15/985,357	05-21-2018			11,148,833	10-19-2021	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT RENDEZVOUS AND DOCKING TECHNIQUES	United States	15/729,502	10-10-2017			10,882,644	01-05-2021	Granted	SPACE SYSTEMS/LORAL, LLC

SPACECRAFT THREE-AXIS ATTITUDE ACQUISITION FROM SUN DIRECTION MEASUREMENT	United States	11/7/09,614	02-22-2007	US 2007-0228218 A1	10-04-2007	7,874,519	01-25-2011	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT TRANSFER ORBIT TECHNIQUES	United States	13/647,207	10-08-2012			8,763,957	07-01-2014	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT WITH AERODYNAMIC CONTROL	United States	14/627,936	02-20-2015	US 2016-0244189 A1	08-25-2016	9,889,950	02-13-2018	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT WITH AERODYNAMIC CONTROL	United States	15/849,289	12-20-2017	US 2018-0134415 A1	05-17-2018	10,562,647	02-18-2020	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT WITH RIGID ANTENNA REFLECTOR DEPLOYED VIA LINEAR EXTENSION BOOM	United States	14/962,941	12-08-2015	US 2017-0158357 A1	06-08-2017	10,259,599	04-16-2019	Granted	SPACE SYSTEMS/LORAL, LLC
STATIONKEEPING TECHNIQUES FOR SPACECRAFT IN INCLINED GEOSYNCHRONOUS ORBIT	United States	15/441,037	02-23-2017	US 2017-0247124 A1	08-31-2017	10,543,937	01-28-2020	Granted	SPACE SYSTEMS/LORAL, LLC
STOWAGE, DEPLOYMENT AND POSITIONING OF RIGID ANTENNA REFLECTORS ON A SPACECRAFT	United States	15/160,258	05-20-2016			10,053,240	08-21-2018	Granted	SPACE SYSTEMS/LORAL, LLC
THRUSTER SUPPORT MECHANISM FOR SATELLITE PROPULSION	United States	14/580,063	12-22-2014	US 2016-0176545 A1	06-23-2016	9,663,251	05-30-2017	Granted	SPACE SYSTEMS/LORAL, LLC
TRUSS STRUCTURE	United States	15/053,998	02-25-2016	US 2016-0251093 A1	09-01-2016	10,227,145	03-12-2019	Granted	SPACE SYSTEMS/LORAL, LLC
TRUSS STRUCTURE OPTIMIZATION TECHNIQUES	United States	15/053,993	02-25-2016	US 2016-0253444 A1	09-01-2016	10,112,731	10-30-2018	Granted	SPACE SYSTEMS/LORAL, LLC
UNIFIED CHEMICAL ELECTRIC PROPULSION SYSTEM	United States	13/223,041	08-31-2011	US 2013-0047578 A1	02-28-2013	9,145,216	09-29-2015	Granted	SPACE SYSTEMS/LORAL, LLC

UNIFIED SPACECRAFT PROPELLANT MANAGEMENT SYSTEM FOR CHEMICAL AND ELECTRIC PROPULSION	United States	15/970,693	05-03-2018		11,021,273	06-01-2021	Granted	SPACE SYSTEMS/LORAL, LLC
WAVEGUIDE HINGE	United States	14/995,070	01-13-2016	US 2017-0200997 A1	10,103,417	10-16-2018	Granted	SPACE SYSTEMS/LORAL, LLC
WAVEGUIDE TO MICROSTRIP LINE N-PORT POWER SPLITTER/COMBINER	United States	15/201,208	07-01-2016		10,177,726	01-08-2019	Granted	SPACE SYSTEMS/LORAL, LLC
WAVEGUIDE T-SWITCH	United States	13/728,745	12-27-2012	US 2014-0184353 A1	9,368,851	06-14-2016	Granted	SPACE SYSTEMS/LORAL, LLC
WIDE BEAM ANTENNA	United States	13/474,084	05-17-2012	US 2013-0307741 A1	8,872,714	10-28-2014	Granted	SPACE SYSTEMS/LORAL, LLC
HIGH LINEARITY SATELLITE PAYLOAD USING SOLID STATE POWER AMPLIFIERS	United States	17/509,579	10-25-2021	US 2022-0045749			Pending	MAXXAR SPACE LLC
STRUCTURAL ARRANGEMENTS USING CARBON FIBER BRAID	United States	16/855,483	4-22-2020		11,327,261	5-10-2022	Granted	SPACE SYSTEMS/LORAL, LLC
SPACECRAFT WITH UNIVERSAL EXTERNAL PORT	United States	17/022,550	9-16-2020	US 2022-0081131			Pending	MAXXAR SPACE LLC
SYSTEMS AND METHODS FOR SATELLITE MOVEMENT	United States	17/038,213	9-30-2020	US 2022-0097873			Pending	MAXXAR SPACE LLC
SPACECRAFT WITH UNIVERSAL TEST PORT	United States	17/083,004	10-28-2020	US 2022-0127023			Pending	MAXXAR SPACE LLC
HIGH LINEARITY SATELLITE PAYLOAD USING SOLID STATE POWER AMPLIFIERS	United States	17/509,579	10-25-2021	US 2022-0045749			Pending	MAXXAR SPACE LLC
SPACECRAFT EXOSKELETON TRUSS STRUCTURE	United States	16/539,348	8-13-2019		11,286,062	3-29-2022	Granted	

HYPERSPHERICAL PAN SHARPENING	United States	13/452,768	4-20-2012			8,737,733	5-27-2014	Granted	DIGITALGLOBE, INC.
AUTOMATED CONVERSION OF TWO-DIMENSIONAL HYDROLOGY VECTOR MODELS INTO VALID THREE-DIMENSIONAL HYDROLOGY VECTOR MODELS	United States	15/490,866	4-18-2017	US 2017-0337416	11-23-2017	9,922,252	3-20-2018	Granted	DIGITALGLOBE, INC.
PAN SHARPENING DIGITAL IMAGERY	United States	13/452,741	4-20-2012			8,761,506	6-24-2014	Granted	DIGITALGLOBE, INC.

PATENT

REEL: 060389 FRAME: 0767

RECORDED: 06/16/2022